Incineration: *A Safe, Proven Disposal Process*

Since 1990, the U.S. Army has used incineration safely and successfully to dispose of the country's stockpile of chemical nerve and blister agent.

The Johnston Atoll Chemical Agent Disposal System (JACADS) used incineration technology during its decade-long operational period to destroy its weapons. The Army uses incineration technology at facilities in Utah, Alabama, Oregon and Arkansas.

The chemical weapons disposal facilities are engineered with specially designed weapons handling processes, remote controlled incineration and disposal equipment, complex control systems and detailed procedures and training to protect the workers, the public and the environment.

The Army's incineration processes are based on years of experience and advances that ensure safe disposal of the various nerve and blister agents, munitions and containers.

Safety Features. The Army's destruction process includes the following safety features:

- Stringent emission standards. The Army monitors stack emissions at levels much stricter than regulatory standards. In turn, the regulatory standards are much lower than amounts that could cause public health problems. Monitoring at higher levels than required demonstrates the Army's commitment to safe operations. In addition, these monitoring levels were established with the assistance and approval of the Department of Health and Human Services' Centers for Disease Control and Prevention and the Surgeon General's Office.
- Higher temperatures to ensure complete agent destruction. Army incinerators operate at significantly higher temperatures and for longer periods of time than commercial hazardous waste incinerators. This ensures complete destruction of chemical agent and total decontamination of the casings and munition pieces.

Gases from the incinerator furnaces pass through a pollution abatement or removal system to further cleanse emissions. As a final safeguard, the emissions are monitored to verify complete destruction of agent.

- Computer programs in the control system monitor the process for such things as incinerator temperatures, airflow rates and pressures. These programs automatically shut down the feeding of agent to the incinerators if process irregularities are detected. Agent processing is not restarted until corrective actions have been taken and approved by oversight agencies.

Additional safety features. Other safety features of the incineration facilities include:

- Air pressure inside the facility is lower than outside air pressure. Air is drawn from outside the facility through the outer rooms and into the most toxic areas. Air from the toxic areas is drawn out of the plant through a series of charcoal filters. This ensures that agent vapors are contained and that only clean ventilation air is released to the environment.
- Explosives and rocket propellants are removed or processed only in special automated explosion containment rooms designed to contain any unlikely explosion.
- Agent is drained from the munitions into storage tanks until it is destroyed. The storage tanks are designed to contain the chemical agent in the event of an earthquake.

Lessons Learned. The Army has a formal lessons learned program to collect improvements made at one site and ensure they are considered for use at all disposal sites. Lessons learned while operating the first disposal plant have benefited

PBCDF

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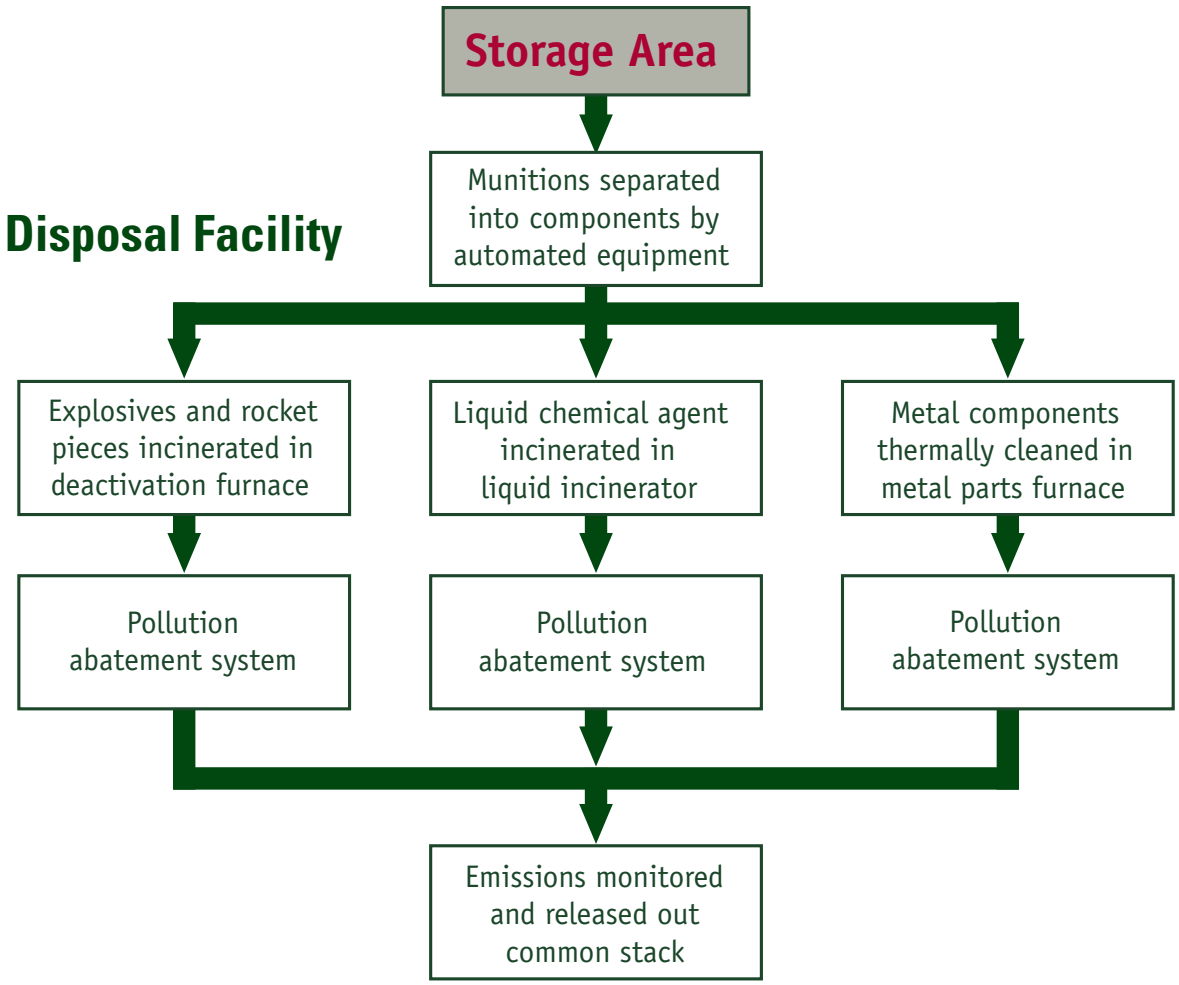
the other facilities. These benefits include special equipment and handling procedures for chemical land mines, techniques for dealing with unusual conditions caused by deteriorating chemical weapons, techniques for working in protective equipment and overall design and process improvements in the facility itself.

Independent Oversight. Congress, the Department of State, Department of Defense, Centers for Disease Control and Prevention, U.S. Environmental Protection Agency, National Academy of Sciences' National Research Council, Organisation for the Prohibition of Chemical Weapons and appropriate state environmental agencies provide formal oversight of the Army's chemical agent disposal program. The baseline incineration process is backed by years of experience and has been scrutinized closely by the public; local, state and federal government officials; the aforementioned oversight agencies; and the court systems. To date, incineration is the only full-scale technology demonstrated in real-time operations to safely treat the complete munition—agent, explosives, metal pieces and packaging material.



A simple flow chart of the Army's incineration processes for chemical agent munitions.